

What is claimed is:

1. A nucleic acid extraction solution comprising a molecule in an amount sufficient to extract nucleic acids from a biological sample, the molecule having the formula $R_1O-CH_2-CH_2-OR_2$, wherein R_1 and R_2 independently are selected from the group consisting of hydrogen and an alkyl group.
2. The solution of claim 1, wherein the alkyl group has 1-6 carbon atoms.
3. The solution of claim 2, wherein the alkyl group is selected from the group consisting of methyl, ethyl, n-propyl, iso-propyl, n-butyl, iso-butyl, sec-butyl, tert-butyl, n-pentyl, iso-pentyl, n-hexyl, and iso-hexyl.
4. The solution of claim 2, wherein the alkyl group is selected from the group consisting of methyl, ethyl, n-butyl, iso-butyl, sec-butyl, and tert-butyl.
5. The solution of claim 1, wherein R_1 is methyl, ethyl, n-butyl, iso-butyl, sec-butyl, or tert-butyl and R_2 is hydrogen.
6. The solution of claim 1, wherein the molecule is selected from the group consisting of 2-methoxyethanol, 2-ethoxyethanol, and 2-n-butyloxyethanol.
7. The solution of claim 1, wherein the molecule is 2-methoxyethanol.
8. The solution of claim 1, wherein the solution comprises from about 0.5% (v/v) to about 5% (v/v) of the molecule.
9. The solution of claim 8, wherein the solution comprises about 1% (v/v) of the molecule.
10. The solution of claim 1, further comprising a buffering agent.
11. The solution of claim 10, wherein the buffering agent is selected from the group consisting of a Tris buffer, a MOPS buffer, and a borate buffer.
12. The solution of claim 1 or 10, wherein the solution has a pH greater than about 7.
13. The solution of claim 12, wherein the pH is greater than about 7 and less than about 13.

- 1 14. The solution of claim 1 or 10 further comprising a detergent.
- 1 15. The solution of claim 14, wherein the detergent is selected from the group consisting of
2 Tween®, Brij®, and Triton®-X100.
- 1 16. A method of extracting nucleic acid from a biological sample, the method comprising:
2 mixing the sample with a solution comprising a molecule having the formula R_1O-CH_2-
3 CH_2-OR_2 , wherein R_1 and R_2 independently are selected from the group consisting of hydrogen
4 and an alkyl group, so that nucleic acid is released from cells or cellular debris in the sample.
- 1 17. The method of claim 16, wherein the alkyl group has 1-6 carbon atoms.
- 1 18. The method of claim 17, wherein the alkyl group is selected from the group consisting of
2 methyl, ethyl, n-propyl, iso-propyl, n-butyl, iso-butyl, sec-butyl, tert-butyl, n-pentyl, iso-pentyl,
3 n-hexyl, and iso-hexyl.
- 1 19. The method of claim 17, wherein the alkyl group is selected from the group consisting of
2 methyl, ethyl, n-butyl, iso-butyl, sec-butyl, and tert-butyl.
- 1 20. The method of claim 16, wherein R_1 is methyl, ethyl, n-butyl, iso-butyl, sec-butyl, or tert-
2 butyl and R_2 is hydrogen.
- 1 21. The method of claim 16, wherein the molecule is 2-methoxyethanol.
- 1 22. The method of claim 16, wherein the solution further comprises a buffering agent.
- 1 23. The method of claim 22, wherein the buffering agent is selected from the group
2 consisting of a Tris buffer, a MOPS buffer, and a borate buffer.
- 1 24. The method of claim 16 or 22, wherein the solution has a pH greater than about 7.
- 1 25. The method of claim 24, wherein the pH is greater than about 7 and less than about 13.
- 1 26. The method of claim 16 comprising the additional step of heating the mixture to a
2 temperature within the range of from about 50°C to about 100°C.

- 1 27. The method of claim 26, comprising heating the mixture to a temperature of from about
2 75°C to about 100°C.
- 1 28. The method of claim 27, comprising heating the mixture to a temperature of from about
2 90°C to about 100°C.
- 1 29. The method of claim 16, wherein the solution comprises about 1% 2-methoxyethanol and
2 borate buffer, pH 9.5.
- 1 30 The method of claim 16, comprising the additional step of amplifying a nucleic acid
2 sequence extracted from the sample.
- 1 31. The method of claim 16, comprising the additional step of detecting a nucleic acid
2 sequence extracted from the sample.
- 1 32. The method of claim 30, wherein the amplification step uses a pair of amplification
2 primers comprising the sequences of SEQ ID NOS: 4 and 5.
- 1 33. The method of claim 32, comprising the additional step of detecting the presence of the
2 nucleic acid sequence with a probe comprising the sequence of SEQ ID NO: 3.
- 1 34. The method of claim 30, wherein the amplification step uses a pair of amplification
2 primers comprising the sequences of SEQ ID NOS: 8 and 9.
- 1 35. The method of claim 34, comprising the additional step of detecting the presence of
2 nucleic acid sequence a probe comprising the sequence of SEQ ID NO: 10.
- 1 36. The method of claim 16, wherein the method lacks a chloroform extraction step, a phenol
2 extraction step, a phenol/chloroform extraction step, or an alcohol precipitation step.
- 1 37. The method of claim 16, wherein the nucleic acid is a bacterial or viral nucleic acid.
- 1 38. The method of claim 16, wherein the biological sample is harvested from a mammal.
- 1 39. The method of claim 38, wherein the biological sample comprises cervical cells or cell
2 debris.

1 40. The method of claim 38, wherein the biological sample comprises breast cells or cell
2 debris.

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